



# TSS THREAT SECURITY SOFTWARE / SPECIALIST

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## ABSTRACT

**Background:** Hand pose detection is the system of recognizing , where the joint of the hand is detected which is used to communicate the machine with the outside environment. As with industrial machinery, most accidents caused due to human error. In order to avoid this accident, the human posture can be used to detect a human error in the industrial area, and when the human limbs enter the operation area, the machine can stop, thus preventing the accident. This can be implemented with the use of Tensor Flow, Media Pipe, and OpenCV. This Project focuses on the hand pose detection model used to prevent accidents at work. The media pipeline hand gesture recognition model has the highest accuracy for recognition with OpenCV. The media pipeline recognizes 21 different locations on the palm that accurately detect the presence of the hand in the environment

**KEYWORDS:** Hand Detection, Machine Learning, Tensor Flow, Media Pipe, OpenCV, Industrial Accident

## INTRODUCTION

To detect the posture of the human in the machine working area to prevent accidents from happening. If the human posture is detected in the working area, then the machine can be immediately stopped or an alarm will be given.

## MATERIALS AND METHODS

In this project the posture detection can be carried out through webcam has been implemented using Faster R-CNN , which is the newer version of the Fast R-CNN. To develop the posture detection system, a real-time pose estimation software called posenet was used.

The system is prepared to be placed on the computer screen or on a holder on top of it. The image acquisition device, a webcam or other type of camera, has to be pointing at the person to be able to capture them from the head to arms. This device is connected to an embedded system where the video is processed in two steps: first, the user's joints' positions are estimated, using a neural network classifier, and then the user's whole posture is processed and validated in order to provide recommendations attending to some of the parameters described.

## RESULTS

As the main cause of the accidents in the industry is the human error. From the above study we conclude that the detection process works in great manner and studied about various concepts like deep learning, computer vision is used to detect the substance while operating Machine and avoid accidents up to greater extent. By using concepts like deep learning, computer vision we can able minimize the number of accidents. Due to availability of large dataset identify

## DISCUSSION

Human posture detection using OpenCV is cheaper compared to other methods like using pyroelectric infrared sensors. Human posture detection using OpenCV does not require any external attachments on the body or external materials for its working. It only requires a computer system with required software's, webcam and the presence of the object u see consideration. It is more appropriate when it comes to daily practical application as compared to other methods. Requires minimum number of materials as compared to other methods It is more effective in practical applications as compared.

The Technique used by our model is Human Body Posture Detection in OpenCv Using Open Pose Mobile Net Technology. OpenCV is a library of programming functions aimed for real- time computer vision. It is cross-platform and free. It supports deep learning frameworks such as Tensor Flow.

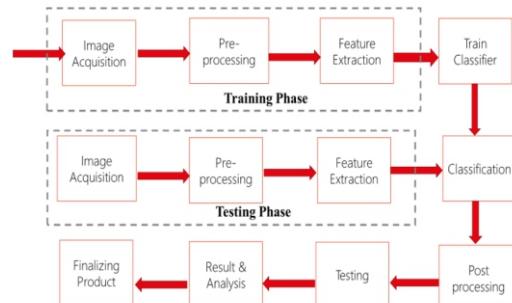


Fig 1.1 Block diagram of System Architecture

## CONCLUSIONS

As the main cause of the accidents in the industry is the human error. From the above study we conclude that the detection process works in great manner and studied about various concepts like deep learning, computer vision is used to detect the substance while operating Machine and avoid accidents up to greater extent. By using concepts like deep learning, computer vision we can able minimize the number of accidents. Due to availability of large dataset identify.

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## TABLES AND FIGURES

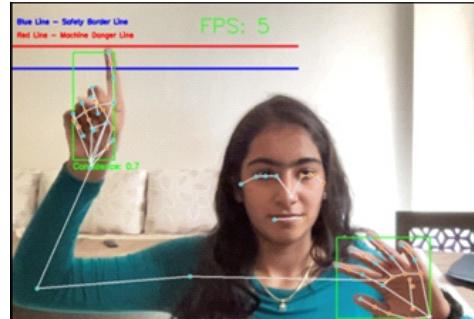


Fig 1.2 Ringing the alarm after reaching the blue line

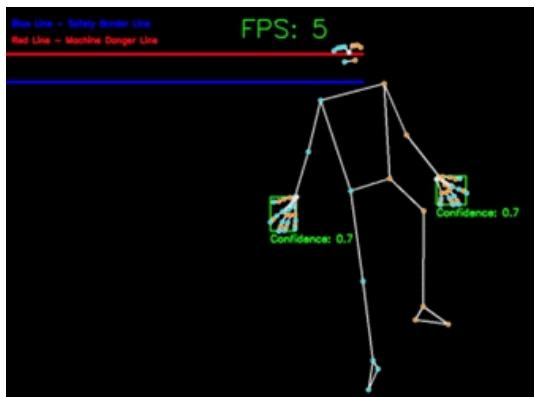


Fig 1.3 Detecting human Skeleton in black mask mode

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